

PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : POULSEN
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Examiner : Nashaat T. Nashed
Art Unit : 1652

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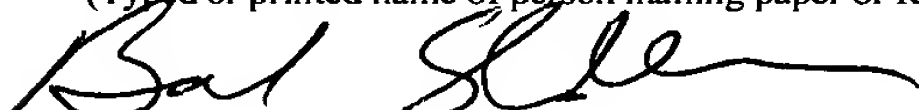
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DECLARATION OF DR. CHARLOTTE POULSEN

Mail Stop
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

DR. CHARLOTTE POULSEN DECLARES AND STATES THAT:

1. I am a named inventor on this application, have read and am familiar with this application, including the presently pending claims thereof, and am making this Declaration in response to issues raised in the April 28, 2004 ("the Office Action"), which I have also read

and understood. This Declaration is also being made in response to the telephonic interviews with the Examiner which took place on or about August 3, 2004 and August 12, 2004.

2. I am advised and therefore believe that claims have been rejected as anticipated by Hansen *et al.* (J. Biol. Chem., April 25, 1997, 272(17):11581-87) and Hamade *et al.* (EP 0 866 103) in view of Stougaard *et al.* (U.S. Patent 6,251,626), which I have read and understood.

3. I understand that in the Office Action the Examiner asserts that Hamade *et al.* teaches a method of preventing fouling of surfaces submerged in water by use of an anti-fouling agent which is produced by an enzyme acting on its substrate, and an anti-fouling composition which comprises the enzyme and its substrate. Specifically, the Examiner states that Hamade *et al.* describes "an enzyme substrate combination capable of producing hydrogen peroxide and [exemplifies] the enzyme-substrate combination with glucose oxidase-glucose and hexose oxidase-glucose" on page 5, lines 14-22. Furthermore, the Examiner asserts that "the substrate of said oxidase can be produced within the composition by a second enzyme action on a precursor substrate such as the action of cellulase on cellulose to produce glucose" and cites Hamade *et al.*, page 5, lines 50-54 for such assertion. After reading and understanding both the Office Action and Hamade *et al.*, it is my belief that the Examiner has misread Hamade *et al.*, and accordingly has made incorrect statements in the Office Action as to the teachings of Hamade *et al.*

4. Specifically, the assertion that Hamade *et al.* teaches that "the substrate of said oxidase can be produced within the composition by a second enzyme action on a precursor substrate such as the action of cellulase on cellulose to produce glucose" is incorrect. Nowhere in Hamade *et al.* is the presence of cellulose mentioned. Rather, the portion of Hamade *et al.* cited by the Examiner actually states that:

An enzyme-substrate combination capable of producing said decomposition product of chitosan is not particularly restricted. Preferred is the case in which the enzyme is a chitosan-decomposing enzyme and the substrate is chitosan.

The chitosan-decomposing enzyme is not particularly restricted in kind but includes chitosanase, cellulase, lysozyme [!], and so forth.

Although cellulase is listed as a possible chitosan-decomposing enzyme, nowhere is the presence of cellulose mentioned. The Examiner has apparently interpreted this passage to mean that the phrase “[a]n enzyme-substrate combination capable of producing said decomposition product of chitosan is not particularly restricted” actually means that any enzyme and substrate may be used, regardless of whether the decomposition of chitosan is the result of the enzyme substrate interaction, and has accordingly substituted cellulose into the list of possible substrates due to the inclusion of cellulase as a possible enzyme.

5. I participated a telephonic interview which took place on or about August 3, 2004, during which I explained to the Examiner that cellulase acts on chitosan as well as cellulose, and that accordingly, cellulase may properly be included in a list of chitosan-decomposing enzymes; and, cellulase may act to decompose chitosan without the presence of cellulose. It was my understanding that the Examiner had understood this explanation.

6. I have been advised, and therefore believe, that a second telephonic interview occurred on or about August 12, 2004 between the Examiner, Thomas Kowalski and Angela Collison, wherein the Examiner asserted that it was not possible for cellulase to act on chitosan and that if cellulase was present, cellulose was necessarily also present.

7. In order to provide an accurate interpretation of the passage in Hamade *et al.* at page 5, lines 50-54, each section of the passage has been diagramed below:

An enzyme-substrate combination capable of producing said decomposition product of chitosan	(Substrate + enzyme) = decomposed chitosan
is not particularly restricted. ↑	(Substrate + enzyme) = decomposed chitosan may be present in different combinations
Preferred is the case in which the enzyme is a chitosan-decomposing enzyme and the substrate is chitosan.	(chitosan + chitosan decomposing enzyme) = decomposed chitosan
The chitosan-decomposing enzyme is not particularly restricted in kind but includes chitosanase, cellulase, lysothyme, and so forth.	(chitosan + (chitosanase or cellulase or lysothyme [!])) = decomposed chitosan

As is shown by the diagramming of the passage above, the chitosan decomposing enzyme may change, but the substrate must be chitosan in order for the enzyme activity to result in decomposed chitosan.

8. Furthermore, attached are two abstracts for Tsai et al. (J. Food Prot., Feb 2004, 67(2):396-8; J. Food Prot., June 2000, 63(6):747-52), both of which demonstrate that chitosan may be digested by cellulase. This confirms my previous assertion that the presence of cellulase in the list of possible enzymes found in Hamade *et al.* does not indicate the presence of cellulose; rather, cellulase is listed because it degrades chitosan.

9. Accordingly, I urge that the rejection based on Hamade et al. must be withdrawn as the assertions in the Office Action are incorrect as Hamade does not disclose or imply the presence of cellulose in the chitosan degrading enzyme-substrate combination described therein.

10. I further declare that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 16th September 2004

Charlotte Poulsen
Charlotte Poulsen